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ABSTRACT

Research on an experimental application in classroom settings of a new method for the teaching of reading, the Ball-Stick-Bird method, is described in this report. The Ball-Stick-Bird method is a code-emphasis approach developed by Rene Fuller. In this system, each letter of the alphabet is taught on the basis of its distinctive features. Capital letters are used exclusively in the first books, and the distinctiveness of each letter is established by showing that it may be composed of a unique arrangement of three basic forms: a line, a circle, and an angle, called, respectively, a stick, a ball, and a bird. The subjects used in the study were first graders; three groups of children had been classified as educable mentally retarded and one group as emotionally disturbed. The IQs of the students ranged from the low 40s into the 80s. Findings indicated that the method was effective in developing the reading skills of students with previous records of reading failure. The results of the study are presented in narrative and table format. (RB)

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The Ball-Stick-Bird$_{TM}$ Method in the Classroom[1].

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This is a report of an experimental application in classroom settings of a new method for the teaching of reading, the Ball-Stick-Bird$_{TM}$ method, developed by Dr. Renee Fuller. Fuller and her coworkers, had previously presented data (Fuller et al 1972) demonstrating that the system had been effective with a small clinical population of severly retarded persons. The IQs of her 23 subjects ranged from 33 to 72, and they had all been selected on the basis of previous reading failure. According to that report, these institutionalized subjects, after being instructed by the Fuller method over the period of one year, in individual sessions, lasting from five to twenty minutes, were able to read with comprehension Fuller system books on the third grade level.

The fact that the central features of the system are based on known psychological principles lent credence to the hypothesis that the Fuller method would be applicable to the general population of beginning readers as well as to students who had been classified as retarded educable with special class placement. Therefore the present study was undertaken to attempt to determine whether:

1. First grade children who received reading instruction by the Ball-Stick-Bird$_{TM}$ method would achieve higher reading skills than similar children in the same schools who received the regular reading program;
2. First grade children who received small group instruction in the Ball-Stick-Bird$_{TM}$ method would achieve as well as those receiving individual instructions; and

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3. Retarded educable children would make greater gains under the Ball-Stick-Bird$_{TM}$ method than they had previously achieved under traditional instruction.

The Ball-Stick-Bird$_{TM}$ Method

The Ball-Stick-Bird$_{TM}$ method may be described by a number of its features. To begin with, it is a code emphasis approach; that is, the alphabetic principle is employed to help the child comprehend the correspondence between phonology and orthography. Chall (1967) concluded from her review of the research in reading that methods emphasizing this approach generally produced the best results. There is, of course, a wide variety of code-emphasis approaches; however, the Fuller system employs some important innovations in teaching the code. First, each letter of the alphabet is taught on the basis of it's "distinctive features". This aspect is related to Gibson's work in perceptual learning which led her to theorize that identification of graphemes and letters involves "a process of isolating and focusing on those features..... that are invariant and critical for rendering each one unique" (Gibson 1963 p. 21).

Later Gibson, Schapiro and Yonas (1968) outlined a set of distinctive features for upper-case Roman capitals. In the Fuller method materials, capitals are used exclusively in the first nine books, and the distinctiveness of each letter is established by showing that it may be composed by a unique arrangement of three basic forms: a line, a circle, and an angle. These are called respectively, a stick, a ball, and a bird. The forms are provided as cardboard cut-outs with the first book, and are color coded for greater differentiation.

Slide 1

Bird-Stick-Ball$_{TM}$ basic forms for building the letters of the alphabet.

During instruction the child is encouraged to manipulate these forms, and is asked to build each letter himself to match a model presented by the instructor. At the same time, the instructor pronounces the most usual sound of the letters and uses it in a word. For example, capital I becomes "the big stick" and its sound is ĭ as in "icky", while H becomes "two big sticks with a little stick across the middle", and the sound is hhh as in "haunted house". Since the child constructs each letter out of the basic forms, the tactile and kinaesthetic modalities are engaged as well as the auditory and visual, in a multisensory learning process. The positive values of this approach is supported by the work of Pick, Pick and Thomas (1966) who found that distinctive-feature training transfered from one sense modality to another.

Since the child is required to associate only the upper case form of each letter with its most usual sound (and not the name of the letter) the mechanics of beginning reading are greatly simplified. The initial memory load is reduced to 26 associations rather than the 104 necessary to pair upper case, lower case, letter-name, and sound to each alphabetic symbol.

Slides 2 through 9, corresponding to pages 3, 4, 11, 12, 27, 28 51, 52, from Fuller Book 1, showing how T, V, P, and R are presented.

We come now to the most compelling aspect of the Fuller system. With the learning of the first two letters, I and T, the child is introduced to the blending principle to produce the word, IT, and by the end of the first lesson, when four letters have been introduced, story reading begins. It is the nature of these stories that provide the intrinsic motivation for continued learning. They are action-packed space odysseys replete with a cast of imaginary characters including VAD, a robot with rocket feet, HAPPY CAT DICK, a space age cat, MIMI the comet, and others. The stories are arranged as cliff-hangers; in order to find out what happens next, the child must learn a new letter or reading principle. Thus there are immediate rewards for learning, and the reading process is reinforced, as it should be by the meaning the child extracts from the text.

Slides 10 through 13 showing
pages from Fuller books, 1, 2 and 3

Procedures

First grade subjects

At the beginning of the 1973-74 academic year, four experimental and four control classes of first graders were identified in two urban schools which qualified for Title I funds. The latter criterion was used for two reasons. to see whether the Fuller method would facilitate learning to read for urban children from

low-income families; and to determine whether teacher-aides (provided for by Title I monies) could successfully share in the teaching task. Reading readiness tests, administered to all the first graders, indicated that the experimental and control groups were comparable at the beginning of the school year.

The teachers and the aides of the experimental classes attended two orientation-training workshops to acquaint them with the Fuller method and materials. Throughout the year the control classes followed the regular reading program for each school, while the Ball-Stick-Bird$_{TM}$ materials constituted the main reading program in the experimental classes. The experimental subjects progressed at their own rates through Books 1 to 4, in small groups, led either by the teacher or the aide. (It had been planned that two experimental classes would receive individual instruction; however, the teachers found this so time-consuming that after the first two weeks they changed to mostly small group instruction). As each child finished each book, the investigator administered the three tests developed by Fuller for each book.

Slides 14, 15 and 16 showing one test of each type

The first test is a list of 10-15 words from the text of the book; the second is a passage reading test containing the same words in the context of meaningful paragraphs, the third is a vocabulary definitions test.

The final evaluation for the first grade subjects consisted of two measures: The California Achievement Test, Reading section, and a Reading Inventory, developed by the investigator, comprising words common to both Ball-Stick-Bird and Bank Street readers, and the Dale-Chall first grade word list.

Slide 17 - the Reading Inventory

Scores on both criterion measures were subjected to statistical analysis to determine whether there were end-of-year differences between the experimental and control groups in reading proficiency.

Special Class Subjects.

In addition to the first grade subjects, another experimental group consisted of four special classes: three groups of children classified as Educable Mentally Retarded, and one group of Emotionally Disturbed children. The RE Children ranged in age from 7 to 12 years with a mean age of 9.8. Their IQs ranged from 45 to 83 with a mean IQ of 69. The ED subjects were 7 to 10 years old with a mean age of 9 years, and a mean IQ of 85. All of the special class subjects had multifaceted problems including neurological impairments, emotional difficulties, and severely disturbed family relations. For this reason it was not considered feasible to match these experimental subjects with control subjects. Instead, for each special class subject, an initial reading level was determined at the beginning of the year, using the Lee-Clark Reading Readiness Test for the non-readers and the California Achievement Test, Reading section, for those who had some reading skills. In addition, the Fuller baseline test, comprising 26 letters of the alphabet and 20 simple words was administered. These scores served as pre-treatment variables for the final evaluation of gain by each student in the special classes.

Instruction in two of the special classes was on an individual basis (by the aide or the teacher) and on a small group basis in the other two. The children progressed at their own pace through the four Fuller books available. They were tested at the end of each book on the three Fuller tests described earlier, and the final evaluation at the end of the year also consisted of the California Achievement Test and the Reading Inventory developed by the investigator. The data was analyzed by applying the t test for correlated measures, to the pre-treatment and final scores on the CAT.

RESULTS

First Grade Subjects

The means and standard deviations on the CAT, Reading section, administered in May, 1974 are presented in Table 1. The Achievement Development Scale Score (ADSS) of the CAT was the criterion measure used to test the null hypothesis that there was no difference between the experimental and control groups on end-of-year reading achievement.

Table 1

Group Means on the Achievement Development Scale Score of the California Achievement Test, Reading Section, for first grade subjects.

Experimental (N=87)			Control (N=95)		
Class	Mean	s.d.	Class	Mean	s.d.
E1	263.84	36.96	C1	274.12	31.37
E2	266.46	33.61	C2	257.17	54.67
E3	305.12	31.45	C3	292.38	42.54
			C4	322.95	27.69
Total	279.45	59.04	Total	283.77	80.92

It may be noted from the table that the experimental group was reduced to three classes. This became necessary after the teacher of the fourth class was ill for two prolonged periods, and then resigned from the school at midyear. The group means on the CAT were 279 and 283 for the experimental and control groups respectively. The t test showed that these means did not differ significantly ($t = -0.42$, $p > .05$), thus the null hypothesis was accepted.

The Reading Inventory developed by the investigator consisted of two paragraphs and four comprehension questions pertaining to each. If a child was able to read paragraph 1 with 90 percent accuracy he was asked to go on to paragraph 2. Mean scores for both paragraphs and for the comprehension questions were calculated for the experimental and control groups. The t tests applied to these means showed that the groups did not differ significantly on this second criterion measure. Although 32 percent of the experimental subjects, as opposed to only 25 percent of the control subjects, were able to go on to paragraph 2 of the Reading Inventory the difference in these proportions was not statistically significant.

Special Class Subjects

The null hypothesis, that the special class children would not appreciably gain in reading achievement at the end of the year of Fuller method instruction, was tested by comparing their pre- and post- treatment CAT, ADSS scores. For the 24 subjects who were tested both in September 1973 and in May, 1974, the t test for correlated data showed that the posttest scores were higher at the .01 level of significance, for each special class and for the group as a whole. Table 2 contains the pre and posttest mean scores for special classes.

Table 2

Pre and Posttest Mean Achievement Development Scale Scores of the California Achievement Test, Reading Section, for Special Class Subjects

	Pretest			Posttest		
Class	N	Mean	s.d.	N	Mean	s.d.
RE1	5	266.40	24.62	8	291.87	52.41
RE2	7	259.00	39.02	11	291.72	57.50
RE3	6	237.83	18.45	6	286.83	15.70
ED4	6	269.33	32.35	5	319.00	18.99
Total	24	257.83	59.30	30[a]	295.33	81.65

[a] One special class child was unavailable for final CAT testing.

Individual pre and posttest ADSS scores for thirty special class subjects are presented graphically in Figure 1. The seven subjects who were unable to take the CAT in September were assigned minimal level pre-ADSS scores based on their low Lee-Clark Reading Readiness scores.

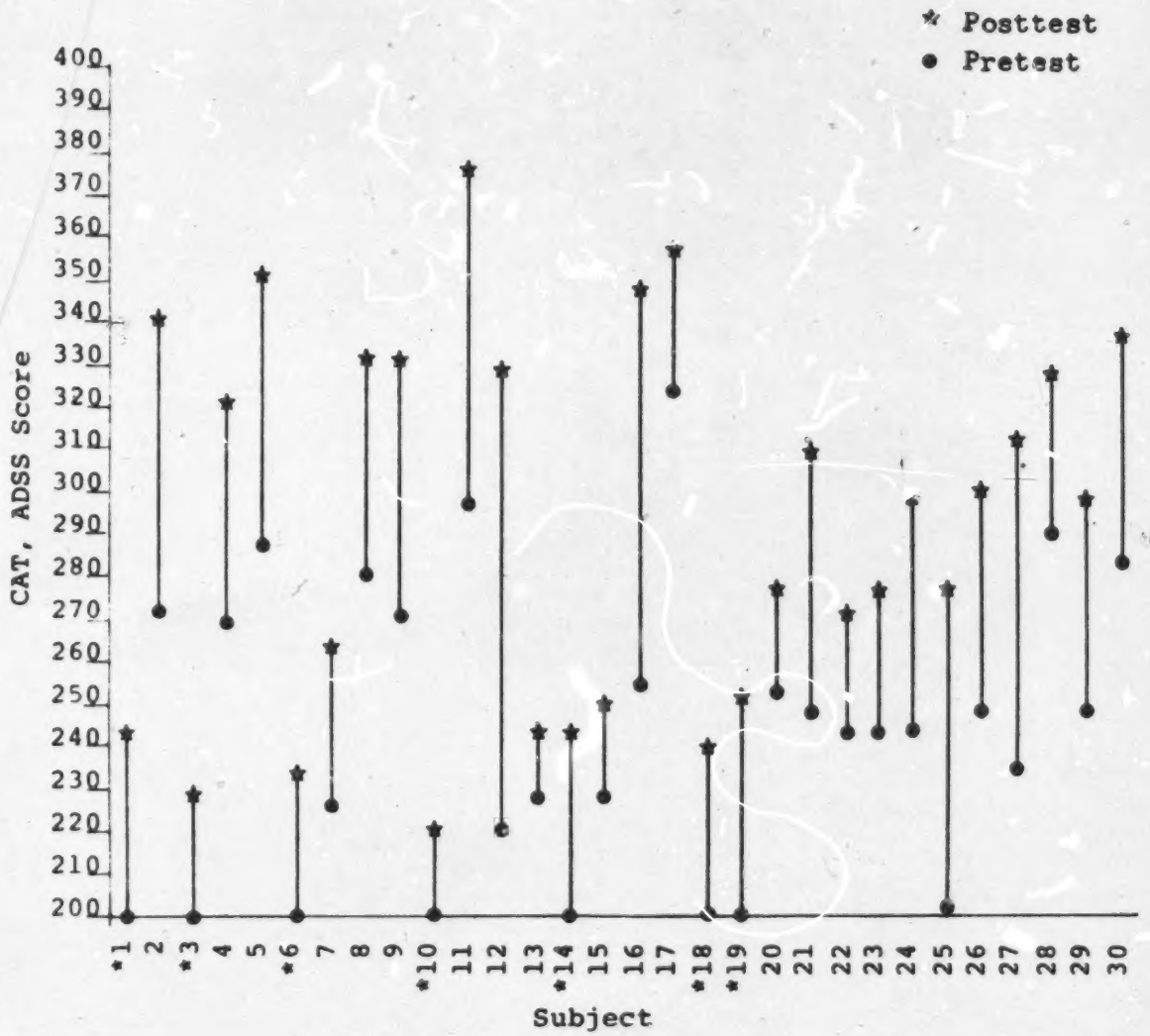

Figure 1. Pre and Posttest ADSS Scores on the California Achievement Test for Individual Special Class Subjects.

*Indicates minimum level ADSS score estimated on basis of low Lee Clark Reading Readiness Score.

End-Of-book Test Scores for Books 1-4

On completion of each book, each child was given three tests developed by Fuller: A word list, a passage reading test, and a definitions test.

The mean scores for the experimental first grade subjects and for special class subjects on these tests for each book are presented in Figure 2.

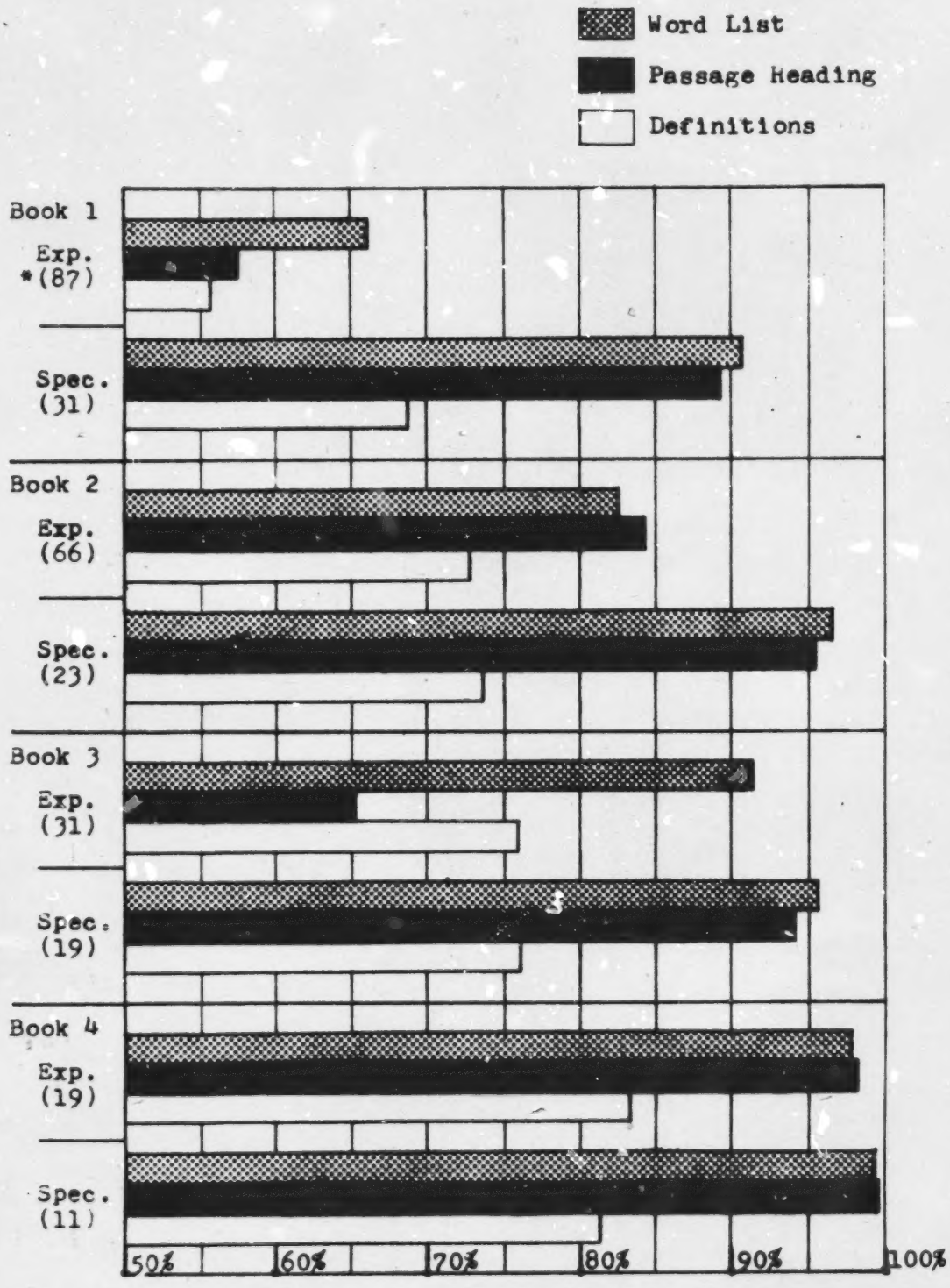

Figure 2. Mean Percentage Correct Scores on Word Lists, Passage Reading, and Definitions for Experimental First Grade and Special Class Subjects for Ball - Stick - Bird Books 1, 2, 3, and 4

*Numbers in parentheses represent the total subjects completing each book.

These data indicate that 75 percent of the first grade subjects were able to complete Book 2 at a good level of mastery. Since all of the letters of the alphabet are presented in both Books 1 and 2, and immediately imbedded into words, it may be implied that these children were able to learn the basic phoneme-grapheme correspondences and to use them in decoding the story material. According to the Ball-Stick-Bird$_{TM}$ manual, the grade level of Book 2 in terms of the various readability formulae places it at grade 2-7 according to Spache, late first-grade according to Fry, and at higher levels in the Dale-Chall and Flesch systems of analysis. Thus it would seem that the Fuller method was effective for the learning of the basic literacy skills for a high proportion of the first grade children. The 35 percent who completed Book 3 were reading material at the third grade level according to the Spache and Fry formulae; and the 21 percent who mastered Book 4 were reading with ease at an even higher grade level. Although reading mechanics have been simplified in the Fuller system, the vocabulary is sophisticated, containing many multisyllabic words. The children who read Book 4 seemed well on their way to becoming excellent readers, enjoying the books and taking pride in being able to read stories of such difficult vocabulary.

These end-of-book tests also revealed that the older RE and ED students developed great facility in reading the Ball-Stick-Bird$_{TM}$ books. They benefited from learning the phonics principles, were able to apply them to new vocabulary, and showed good comprehension of the fantasy materials. Perhaps most importantly, they became enthusiastic readers and experienced successful achievement.

Conclusions and Discussion

The results of the data analysis support the following conclusions in relation to the focus of the study:

1-The sample of first grade children who remained in the experimental classes throughout the year and received Ball-Stick-Bird$_{TM}$ reading method instruction attained the same level of reading achievement on the California Achievement Tests and on the Reading Inventory as did their counterparts in the control classes under the school's regular reading program.

2-The special class children made significant gains in reading ability from the beginning to the end of the year with the Ball-Stick-Bird$_{TM}$ reading method and materials. This was true for each special class and for the group as a whole.

It was not possible to determine the differential effects of individual vs. small group instruction since the first grade teachers did not find it feasible to continue complete individualization after the first two weeks. It should be noted that the reading groups varied in size from three to eight children and were constantly being reconstituted in a flexible manner to accommodate individual children's progress.

With regard to the motivational aspects of the materials, the reports of the teachers indicated that the children enjoyed the colorful format and content of the books and looked forward to reading. Speaking for themselves, they found the books innovative and interesting, and all felt that the children learned the letter-sound relationships more quickly and with greater retention than in other systems.

Since the end-of book tests corroborated this for at least the 75 percent of the first graders who completed Book 2, it would seem that the Ball-Stick-Bird$_{TM}$ method is an excellent vehicle for teaching the basic phonics skills within the context of enjoyable stories. However, most of the teachers expressed a need for supplementary materials and workbooks that the children could use to review the concepts and vocabulary presented in the stories. Therefore, it is strongly recommended that this basic method for the teaching of reading be integrated into a comprehensive language arts program in the classroom. It is hoped that the initial applications of the system in a variety of classes will generate suggestions for oral and written language activities to broaden the scope of the program, and to deepen comprehension by linking experience with its symbolic representation.

The special class children were especially enthusiastic about the materials. Many of the older students had been exposed to other reading methods previously and had some sight vocabulary at the beginning of the year. It was our observation that these youngsters, by virtue of having lived and been exposed to language for a greater number of years than the first graders, understood the Ball-Stick-Bird$_{TM}$ stories and appreciated their spaceage content and humor at a higher level, despite their retardation and other problems. They were able to progress quickly through the materials, and they made almost perfect scores on the word lists and passage reading end-of-book tests. Their obvious pride in this level of accomplishment was further enhanced when it was arranged for a group of them to tutor some first grade children. This was probably the first time in their lives they had experienced such successful achievement.

Finally, the experiment demonstrated that non-professional teacher-aides can be effective teachers of the Ball-Stick-Bird$_{TM}$ reading method. The aides were included in the orientation-training workshops along with the teachers at the beginning of the year. In all of the classes, the aides participated fully in the teaching process, alternating with the teacher in small group reading sessions. The experience of the aides in the program had two-fold benefits: the children received the additional instructional time, and the aides took satisfaction and pride in their positive contribution to the reading program.

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